Curriculum Skills and Progression Map
Design and Technology

Key Concepts:

Inspiration and Innovation

Design

Make

Evaluate

	Design	Make	Evaluate	Structures	Food
		ELG: Creating with Materials Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.			
Relevant ELG	**ELG: Listening, Attention and Understanding** Hold conversation when engaged in back-and-forth exchanges with their teacher and peers. **ELG: Speaking** Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary. **ELG: Self-Regulation** Set and work towards simple goals, being able to wait for what they want and control their immediate impulses when appropriate.	**ELG: Managing self** Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. **ELG: Fine motor skills** Use a range of small tools, including scissors, paintbrushes and cutlery. **ELG: Creating with Materials** Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Share their creations, explaining the process	**ELG: Listening, Attention and Understanding** Hold conversation when engaged in back-and-forth exchanges with their teacher and peers. **ELG: Speaking** Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate;		**ELG: Managing self** Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. Set and work towards simple goals, being able to wait for what they want and control their immediate impulses when appropriate. **ELG: Fine motor skills** Use a range of small tools, including scissors, paint brushes and cutlery;
Vocabulary: **join, connect, build, construct, collaborate, extend, evaluate, junk modelling, cellotape, masking tape, scissors, glue, safety, texture, instructions, model, make, masking tape**					

KS1 Readiness objectives	• To describe something they want to make / build / construct • To say who they are making / building / constructing for • To talk about what materials they are going to use when making / building / constructing	• To make / build / construct objects using a variety of materials • To join materials together when making / building / constructing	• To talk about their constructions / products, and what they are pleased with • To talk about their constructions and say how it could be even better • To talk about everyday objects that they like and say why they are good	• To build / construct structures from a range of materials to a design brief that they have created or been given. • To build / construct structures that are tall or strong. • To know that tape and glue can join materials together and can make structures stronger.	• To recognise different foods as either healthy or unhealthy • To know how to use basic cutlery and utensils to make and eat food • To follow simple instructions to make different foods • To know when we make food for other people that it needs to be appealing.

Programmes of study **Year 1**	**Pupils should be taught to:** Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment]. When designing and making, pupils should be taught to: **Design** • design purposeful, functional, appealing products for themselves and other users based on design criteria • generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology **Make** • select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] • select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics **Evaluate** • explore and evaluate a range of existing products • evaluate their ideas and products against design criteria **Technical knowledge** • build structures, exploring how they can be made stronger, stiffer and more stable • explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

Organisation	**DESIGN**	**MAKE**	**EVALUATE**	**Technical knowledge and Understanding**
Progression objectives	**Use knowledge of existing products to support plans for a similar product.** Describe, explore and investigate products that have been disassembled. **Use construction kits, pictures, templates, mock ups and captions to plan and design.**	**Explore and talk about the characteristics of an increasing range of materials.** Select and use simple tools to cut and join a range of materials. **To know what a hole punch and stapler is and how they are used**.	**Talk about and describe key features of a range of products.** Explore and evaluate a range of existing products.	**Explore and talk about products made by famous inventors, designers, engineers, chefs and manufacturers, e.g. the vacuum cleaner.** To give examples of healthy foods and sort where they came from. **Understand how to join fabric to make a simple 3D textile product.**
Assessment opportunities	Design appealing products for a particular user based on simple design criteria. ·	Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely. · Select from	Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences.	Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. ·

Preparing Fruit and Vegetables	Generate initial ideas and design criteria through investigating a variety of fruit and vegetables. · Communicate these ideas through talk and drawings.	a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product.	· Evaluate ideas and finished products against design criteria, including intended user and purpose.	Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of The eatwell plate. · Know and use technical and sensory vocabulary relevant to the project.
Templates and Joining	Design a functional and appealing product for a chosen user and purpose based on simple design criteria. · Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups and information and communication technology.	Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing. · Select from and use textiles according to their characteristics.	Explore and evaluate a range of existing textile products relevant to the project being undertaken. · Evaluate their ideas throughout and their final products against original design criteria.	Understand how simple 3-D textile products are made, using a template to create two identical shapes. · Understand how to join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling. · Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons. · Know and use technical vocabulary relevant to the project.
Vocabulary	**Textiles – Templates and Joining Techniques / Names of existing products/ Joining and finishing techniques** - Tools Fabrics and component, Template, Pattern pieces, Mark out, Join, Decorate, Finish, Features, Suitable, Quality, Mock-up, Design brief Design criteria, Make , Evaluate, User, Purpose, Function **Food – Preparing fruit and vegetables/ Fruit and vegetable names/ Names of equipment and utensils** - Sensory vocabulary (e.g.Soft, Juicy, Crunchy, Sweet, Sticky, Smooth, Sharp, Crisp, Sour, Hard, Flesh, Skin, Pip, Core, Slicing, Peeling, Cutting, Squeezing, Healthy diet, Choosing, Ingredients, Planning, Investigating tasting, Arranging, Popular, Design, Evaluate, Criteria			

Autumn	Spring	Summer
Food – Preparing Fruit and Vegetables Product – A Healthy Salad Chef – Jamie Oliver	Food – Preparing Fruit and Vegetables Textiles – Templates and Joining Techniques	Textiles – Templates and Joining Techniques Product – A Hand Puppet Inventor/Designer – Margarete Steiff

Programmes of study **Year 2**	**Pupils should be taught to:** Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment]. When designing and making, pupils should be taught to: **Design** • design purposeful, functional, appealing products for themselves and other users based on design criteria • generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology **Make** • select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] • select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics **Evaluate** • explore and evaluate a range of existing products • evaluate their ideas and products against design criteria **Technical knowledge** • build structures, exploring how they can be made stronger, stiffer and more stable • explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

Organisation	DESIGN	MAKE	EVALUATE	TECHNICAL KNOWLEDGE and Understanding
Progressive objectives	**Use knowledge of a range of products to inform plans and designs.** Talk about and disassemble products and describe their function. **Use simple prototypes, labelled sketches and detailed instructions in plans and designs.**	**Select materials and components according to known characteristics and functions.** Select and use an increasing range of tools to cut, shape and join materials and components. **Make simple paper models, mock-ups and templates.**	**Investigate and compare a range of similar existing products.** Compare and contrast the similarities and differences of products with the same function.	**Gain an understanding of the way in which the work of famous inventors, designers, engineers, chefs and manufacturers have impacted on the development of product design and function, e.g. Dyson use to inform and support evaluation and further development of own product.** Build structures using Lego, card and junk modelling, exploring how they can make the structure more secure, strong and stable.

				With support attach a fixed axle to a chassis and add wheels ensuring that they can move freely.
Assessment opportunities **Wheels and Axles**	Generate initial ideas and simple design criteria through talking and using own experiences. · Develop and communicate ideas through drawings and mock-ups	· Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing. · Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics.	Explore and evaluate a range of products with wheels and axles. · Evaluate their ideas throughout and their products against original criteria.	Explore and use wheels, axles and axle holders. · Distinguish between fixed and freely moving axles. · Know and use technical vocabulary relevant to the project.
Freestanding Structures	Generate ideas based on simple design criteria and their own experiences, explaining what they could make. · Develop, model and communicate their ideas through talking, mock-ups and drawings.	Plan by suggesting what to do next. · Select and use tools, skills and techniques suitable for the task, explaining their choices. · Select new and reclaimed materials and construction kits to build their structures. · Use simple finishing techniques suitable for the structure they are creating.	Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings. · Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.	Know how to make freestanding structures stronger, stiffer and more stable. · Know and use technical vocabulary relevant to the project.
Vocabulary	**Freestanding Structures** - Cut , Fold, Join, Fix, Structure, Wall, Tower, Framework, Weak, Strong, Base, Top, Underneath, Side, Edge, Surface, Thinner, Thicker, Corner, Point, Straight, Curved, Metal, Wood, Plastic, Circle, Triangle, Square, Rectangle, Cuboid, Cube, Cylinder **Mechanisms** – Wheels and Axles, Vehicle, Wheel, Axle, Axle holder, Chassis, Body, Cab, Assembling, Cutting, Joining, Shaping, Finishing Fixed, Free, Moving, Mechanism, Names of tools, Equipment and materials used, Design , Make, Evaluate, Purpose, User ,Criteria Functional, Design, Make, Evaluate, User, Purchase, Ideas, Design, Criteria, Product, Function			

Autumn	Spring	Summer
Mechanisms – Wheels and Axles Product – A cart to carry Red Reading Hood's books Designers – Hot wheels designer Larry Wood	Mechanisms – Wheels and Axles Freestanding Structures	Freestanding Structures Product –Playground equipment/furniture Designer – Isamu Noguchi

Programmes of study Year 3	**Pupils should be taught to:** Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].When designing and making, pupils should be taught to: **Design** • use research and develop design criteria to inform the design of innovative, functional, • appealing products that are fit for purpose, aimed at particular individuals or groups • generate, develop, model and communicate their ideas through discussion, annotated • sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and • computer-aided design **Make** • select from and use a wider range of tools and equipment to perform practical tasks • [for example, cutting, shaping, joining and finishing], accurately • select from and use a wider range of materials and components, including construction • materials, textiles and ingredients, according to their functional properties and aesthetic • qualities **Evaluate** • investigate and analyse a range of existing products • evaluate their ideas and products against their own design criteria and consider the • views of others to improve their work • understand how key events and individuals in design and technology have helped • shape the world **Technical knowledge** • apply their understanding of how to strengthen, stiffen and reinforce more complex • structures • understand and use mechanical systems in their products [for example, gears, pulleys, • cams, levers and linkages] • understand and use electrical systems in their products [for example, series circuits • incorporating switches, bulbs, buzzers and motors] • apply their understanding of computing to program, monitor and control their products.

Organisation	DESIGN	MAKE	EVALUATE	TECHNICAL KNOWLEDGE and Understanding
Progressive objectives	**Use research to develop design criteria that are fit for purpose.** Disassemble products and describe in detail their functions. **Use annotated sketches, cross-sectional, exploded diagrams and increasingly complex prototypes.**	**Select from and use a wide range of materials and components according to both functional and aesthetic qualities.** Select and use tools and equipment to measure, mark out and shape materials and components **Make increasingly complex paper models, mock-ups and templates.**	**Investigate and begin to analyse a range of existing products.** Use knowledge of similarities and differences between products with the same function to support identification of most effective product	**Gain an understanding of the way in which the work of famous inventors, designers, engineers, chefs and manufacturers have impacted on the development of product design and function, e.g. Dyson use to inform and support evaluation and further development of own product.** To know what is meant by a balanced diet and to sort foods into different food types. **Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.**
Assessment opportunities **Cooking and Nutrition**	· Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose. · Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas.	· Plan the main stages of a recipe, listing ingredients, utensils and equipment. · Select and use appropriate utensils and equipment to prepare and combine ingredients. · Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics.	· Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs. · Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.	Know how to use appropriate equipment and utensils to prepare and combine food. · Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught. · Know and use relevant technical and sensory vocabulary appropriately.

Structures	· Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product. · Develop ideas through the analysis of existing products and use annotated sketches and prototypes to model and communicate ideas.	· Order the main stages of making. · Use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy. · Explain their choice of materials according to functional properties and aesthetic qualities. · Use finishing techniques suitable for the product they are creating.	Investigate and evaluate a range of existing shell structures including the materials, components and techniques that have been used. · Test and evaluate their own products against design criteria and the intended user and purpose.	· Develop and use knowledge of how to construct strong, stiff shell structures. · Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. · Know and use technical vocabulary relevant to the project.
Vocabulary	**As with Year 2 for structures plus** -Shell Structures, Three dimensional 3D, Shape, Net, Cube, Cuboid, Prism, Vertex, Edge, Face, Length, Width, Breadth, Capacity, Marking out, Scoring, Shaping, Tabs, Adhesives, Joining, Assemble, Accuracy, Material, Stiff, Strong, Reduce, Reuse, Recycle, Corrugating, Ribbing, Laminating, Font, Lettering, Text, Graphics, Decision, Evaluating, Design brief, Design criteria, Innovative, Prototype **As with Year 1 Food – Healthy and Varied Diet plus** - Name of products, Names of equipment, Utensils, Techniques and ingredients, Texture, Taste, Sweet, Sour, Hot, Spicy, Appearance, Smell, Preference, Greasy, Moist, Cook, Fresh, Savoury, Hygienic, Edible, Grown, Reared, Caught, Frozen, Tinned, Processed Seasonal, Harvested, Healthy/varied, Diet, Planning, Design criteria, Purpose, User, Annotated sketch, Sensory, evaluations			

Autumn	Spring	Summer
Food – Healthy and Varied Diet Product – A Healthy Wrap Chef – Joe Wicks	Shell Structures	Shell Structures Product – pencil pot IKEA designers – E.g. Mikael Axelsson

Programmes of study	**Pupils should be taught to:** Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example,

Year 4	the home, school, leisure, culture, enterprise, industry and the wider environment].When designing and making, pupils should be taught to: **Design** • use research and develop design criteria to inform the design of innovative, functional, • appealing products that are fit for purpose, aimed at particular individuals or groups • generate, develop, model and communicate their ideas through discussion, annotated • sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and • computer-aided design **Make** • select from and use a wider range of tools and equipment to perform practical tasks • [for example, cutting, shaping, joining and finishing], accurately • select from and use a wider range of materials and components, including construction • materials, textiles and ingredients, according to their functional properties and aesthetic • qualities **Evaluate** • investigate and analyse a range of existing products • evaluate their ideas and products against their own design criteria and consider the • views of others to improve their work • understand how key events and individuals in design and technology have helped • shape the world **Technical knowledge** • apply their understanding of how to strengthen, stiffen and reinforce more complex • structures • understand and use mechanical systems in their products [for example, gears, pulleys, • cams, levers and linkages] • understand and use electrical systems in their products [for example, series circuits • incorporating switches, bulbs, buzzers and motors] • apply their understanding of computing to program, monitor and control their products.

Organisation	DESIGN	MAKE	EVALUATE	TECHNICAL KNOWLEDGE and Understanding
Progressive objectives	**Generate plans and designs based on research and ideas that take account of the users' views and the intended purpose.** Explain in detail how products are put together and taken apart. **Produce detailed designs and plans using prototypes, commentary and diagrams that include accurate measurements.**	**Select a range of appropriate tools to cut, shape and join materials and components effectively.** Select and use tools and equipment to measure, mark out and shape materials and components accurately. **Make a range of complex paper models, mock-ups and templates.**	Investigate and use analysis of existing products to inform own work. **Identify from a range the key features and functions needed to create an effective and efficient working product.**	**Gain an understanding of the way in which the work of famous inventors, designers, engineers, chefs and manufacturers have impacted on the development of product design and function, e.g. Dyson use to inform and support evaluation and further development of own product.** **Understand how to securely join two pieces of fabric together.** **Design and make a product showing lever and linkage mechanisms.**
Assessment opportunities **Templates and Joining Combining fabric shapes**	· Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s. · Produce annotated sketches, prototypes, final product sketches and pattern pieces.	· Plan the main stages of making. · Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing. · Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern.	· Investigate a range of 3-D textile products relevant to the project. · Test their product against the original design criteria and with the intended user. · Take into account others' views. · Understand how a key event/individual has influenced the development of the chosen product and/or fabric.	· Know how to strengthen, stiffen and reinforce existing fabrics. · Understand how to securely join two pieces of fabric together. · Understand the need for patterns and seam allowances. · Know and use technical vocabulary relevant to the project.
Levers and Linkages	· Generate realistic ideas and their own design criteria through discussion, focusing on the needs of the user. · Use annotated sketches and prototypes to	· Order the main stages of making. · Select from and use appropriate tools with some accuracy to cut, shape and join paper and card. · Select from and use finishing techniques	· Investigate and analyse books and, where available, other products with lever and linkage mechanisms. · Evaluate their own products and ideas against criteria and	· Understand and use lever and linkage mechanisms. · Distinguish between fixed and loose pivots. · Know and use technical vocabulary relevant to the project.

	develop, model and communicate ideas.	suitable for the product they are creating.	user needs, as they design and make.	
Vocabulary	**As with Year 1 for Textiles – 2D shape to 3D product** Fabric, Names of fabric, Fastening, Zip, Button, Structure, Finishing technique, Strength, Weakness, Stiffening, Templates, Stitch, Seam, Seam allowance, Wadding, Reinforce, Wrong side, Right side, Needles, Thread, User Purpose, Design, Model, Evaluate, Prototype, Annotated sketch, Functional, Innovative, Investigate, Label, Drawing, Aesthetics, Function Pattern pieces **Levers and Linkages** - mechanism, lever, linkage, pivot, slot, bridge, guide system, input, process, output linear, rotary, oscillating, reciprocating user, purpose, function prototype, design criteria, innovative, appealing, design brief			

Autumn	Spring	Summer
Textiles – 2D Shape – 3D product Product – A cushion Designer – Orla Kiely	Textiles – 2D Shape – 3D product Mechanical systems – Levers and Linkages	Mechanical Systems - Levers and Linkages Product – Pop Up Card Inventor – Variety of Pop Up Book Makers

Programmes of study	**Pupils should be taught to:**

Year 5	Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].When designing and making, pupils should be taught to: **Design** • use research and develop design criteria to inform the design of innovative, functional, • appealing products that are fit for purpose, aimed at particular individuals or groups • generate, develop, model and communicate their ideas through discussion, annotated • sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and • computer-aided design **Make** • select from and use a wider range of tools and equipment to perform practical tasks • [for example, cutting, shaping, joining and finishing], accurately • select from and use a wider range of materials and components, including construction • materials, textiles and ingredients, according to their functional properties and aesthetic • qualities **Evaluate** • investigate and analyse a range of existing products • evaluate their ideas and products against their own design criteria and consider the • views of others to improve their work • understand how key events and individuals in design and technology have helped • shape the world **Technical knowledge** • apply their understanding of how to strengthen, stiffen and reinforce more complex • structures • understand and use mechanical systems in their products [for example, gears, pulleys, • cams, levers and linkages] • understand and use electrical systems in their products [for example, series circuits • incorporating switches, bulbs, buzzers and motors] • apply their understanding of computing to program, monitor and control their products.

Organisation	DESIGN	MAKE	EVALUATE	TECHNICAL KNOWLEDGE

Progressive objectives	**Clarify and justify plans, designs and ideas by drawing upon and using a range of relevant sources of information.** Explain in detail how products are put together and taken apart and each of their functions. **Produce detailed designs and plans drawn to scale from a range of viewpoints, using pattern pieces and computer-aided design packages effectively.**	**Select a range of appropriate tools to cut, shape and join materials and components with accuracy and precision.** Use an increasing range of tools and equipment to measure, mark out and shape materials and components accurately. **Make and adapt where necessary complex mock-ups and templates.**	**Use analysis of existing products supported by accurate factual information to inform own work.** Test and evaluate products to identify the variants which may affect the function of a product.	**Gain an understanding of the way in which the work of famous inventors, designers, engineers, chefs and manufacturers have impacted on the development of product design and function, e.g. Dyson use to inform and support evaluation and further development of own product.** Understand the source, seasonality and characteristics of a broad range of Ingredients. **Understand how gears and pulleys can be used effectively within a product.**
Assessment opportunities **Cooking and Nutrition**	· Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification. · Explore a range of initial ideas, and make design decisions to develop a final product linked to user and purpose. · Use words, annotated sketches and information and communication technology as appropriate to develop and communicate ideas.	· Write a step-by-step recipe, including a list of ingredients, equipment and utensils · Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients. · Make, decorate and present the food product appropriately for the intended user and purpose.	Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/charts such as star diagrams. · Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements. · Understand how key chefs have influenced eating habits to promote varied and healthy diets.	· Know how to use utensils and equipment including heat sources to prepare and cook food. · Understand about seasonality in relation to food products and the source of different food products. · Know and use relevant technical and sensory vocabulary.
Pulleys or Gears	· Generate innovative ideas by carrying out research	· Produce detailed lists of tools, equipment and materials.	· Compare the final product to the original design	· Understand that mechanical and electrical systems have an input,

	using surveys, interviews, questionnaires and web-based resources. · Develop a simple design specification to guide their thinking. · Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.	Formulate step-by-step plans and, if appropriate, allocate tasks within a team. · Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost.	specification. · Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. · Consider the views of others to improve their work. · Investigate famous manufacturing and engineering companies relevant to the project.	process and an output. · Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement. · Know and use technical vocabulary relevant to the project.
Vocabulary	**As with Year 1 and 3 - Food – Celebrating culture and seasonality** – Ingredients, Yeast, Dough, Bran, Flour, Wholemeal, Unleavened, Baking soda, Spice Herbs, Fat, Sugar, Carbohydrate, Protein, Vitamin, Nutrients, Nutrition, Healthy, Varied, Gluten, Dairy, Allergy, Intolerance, Savoury, Source, Seasonality Utensils, Combine, Fold, Knead, Stir, Pour, Mix, Rubbing in, Whisk, Beat, Roll out, Shape, Sprinkle, Crumble, Design specification, Innovative, Research Evaluate, Design brief **Mechanical systems – Pulleys or Gears** – Pulley, Drive belt, Gear, Rotation, Spindle, Driver, Follower, Ratio, Transmit, Axle, Motor, Circuit, Switch, Circuit diagram, Annotated drawings, Exploded diagrams, Mechanical system, Electrical system, Input, Process, Output, Design decisions, Functionality			

Autumn	Spring	Summer
Mechanical Systems – Pulleys or Gears Product – a moving vehicle Inventor - Karl Benz – first motorized engines	Mechanical Systems – Pulleys or Gears Food – Celebrating culture and seasonality	Food – Celebrating culture and seasonality Product – Pizza Chef - Marcus Wareing

Programmes of study Year 6	**Pupils should be taught to:** Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].When designing and making, pupils should be taught to: **Design** • use research and develop design criteria to inform the design of innovative, functional, • appealing products that are fit for purpose, aimed at particular individuals or groups • generate, develop, model and communicate their ideas through discussion, annotated • sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and • computer-aided design **Make** • select from and use a wider range of tools and equipment to perform practical tasks • [for example, cutting, shaping, joining and finishing], accurately • select from and use a wider range of materials and components, including construction • materials, textiles and ingredients, according to their functional properties and aesthetic • qualities **Evaluate** • investigate and analyse a range of existing products • evaluate their ideas and products against their own design criteria and consider the • views of others to improve their work • understand how key events and individuals in design and technology have helped • shape the world **Technical knowledge** • apply their understanding of how to strengthen, stiffen and reinforce more complex • structures • understand and use mechanical systems in their products [for example, gears, pulleys, • cams, levers and linkages]

	• understand and use electrical systems in their products [for example, series circuits • incorporating switches, bulbs, buzzers and motors] • apply their understanding of computing to program, monitor and control their products.			
Organisation	**DESIGN**	**MAKE**	**EVALUATE**	**TECHNICAL KNOWLEDGE**
Progressive objectives	**Use research and exploration, such as the study of different cultures, to identify and understand user needs.** Explain and describe in detail how products are put together and taken apart and each of their functions. **Develop and communicate ideas using annotated sketches, detailed plans, 3D and mathematical modelling, oral and digital presentations and computer-based tools.**	**Select from and use a wider, more complex range of materials, components and ingredients, taking account of their properties.** Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture.	Understand developments in D&T, its impact on individuals, society and the environment. **Test, evaluate and refine ideas and products against a specification, taking into account the views of intended users**	Understand how more advance mechanical systems used in their product enable changes in movement and force. **Explore and describe how switches can be used in a range of circuits to control components, e.g. lights in a lighthouse, a movement sensor in a burglar alarm.** Relate the work of designers, engineers, chefs, technologists and manufactures to own products and designs.
Assessment opportunities **Structures**	Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources. · Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost. · Generate, develop and model innovative ideas, through	Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. · Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. · Use finishing and decorative techniques suitable for the product they are designing and making	Investigate and evaluate a range of existing frame structures. · Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. · Research key events and individuals relevant to frame structures.	Understand how to strengthen, stiffen and reinforce 3-D frameworks. · Know and use technical vocabulary relevant to the project.

	discussion, prototypes and annotated sketches.			
Circuits and Switches	Use research to develop a design specification for a functional product that responds automatically to changes in the environment. Take account of constraints including time, resources and cost. · Generate and develop innovative ideas and share and clarify these through discussion. · Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams.	Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. · Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product. · Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment.	Continually evaluate and modify the working features of the product to match the initial design specification. · Test the system to demonstrate its effectiveness for the intended user and purpose. · Investigate famous inventors who developed ground-breaking electrical systems and components.	· Understand and use electrical systems in their products. · Apply their understanding of computing to program, monitor and control their products. · Know and use technical vocabulary relevant to the project.
Vocabulary	**As with Year 2 and 3 Frame Structures** - Frame structure, Stiffen, Strengthen, Reinforce, Triangulation, Stability, Shape, Join, Temporary, Permanent Design brief, Specification, Prototype, Annotated sketch, Purpose, User, Innovation, Research, Functional **As with Year 4 Electrical systems** – More complex switches and circuits, Series circuit, Parallel circuit, Names of switches and components , Input device, Output device, System, Monitor, Control, Program, Flowchart, Function, Innovative, Design specification, Design brief, User, Purpose			

Autumn	Spring	Summer
Electrical Systems – More complex switches and circuits Product – Christmas card/microbit toy Inventor - Nick Holonyak Jr – LED lightbulb	Electrical Systems – More complex switches and circuits Frame Structures	Frame Structures Product – Bridge Inventor – Joseph Strauss